Spanish gardens in their historical background, by John H. Harvey

Spain is a continent rather than a country - Quien dice España dice todo - and our tour was necessarily limited to one of its realms, Andalusia. We saw Spanish gardening in concentrated form, and in a few days combined visits to some of the finest modern gardens with a serious study of the world's oldest living garden, that of the Generalife at Granada. Among ghosts, we even went to a Moorish garden three centuries older, of A.D. 950, at the palace-city ruin of Medina Azahara.

In ten days we penetrated through the outer growing layers of horticulture to its heart; at leisure we can now turn round and consider chronological development in normal order. The history of aesthetic horticulture as opposed to the production of fruit, vegetables and medicinal herbs begins, in Spain as in England, with the introduction of ancient concepts from the Near East. Whereas with us the impulse came indirectly through the Normans with their simultaneous conquest of Sicily, reinforced by returning Crusaders a generation later, in Spain there had been a direct oriental invasion early in the eighth century. The Peninsula became a province subject to Damascus just after the Muslim tide had appropriated the Garden-Idea of the ancient Near East, as found in Persia and Iraq, and spread it throughout the Mediterranean world. Later political developments gave to Spain a special pre-eminence as the seat of the Western Caliphate (756-1031) of Cordova.

Arab chroniclers record that, while we in England were still in the Dark Ages, Moorish Spain had reached a pitch of luxury in which gardens had a primary position. What was said by Al-Makkari of the pleasure grounds of Murcia by the tenth century: "filled with scented flowers, singing birds and water-wheels with rumorous sound", sets the keynote of this paradisial culture.[1] A century later a list of the plants cultivated at Seville was compiled and shows that there had been a decided advance beyond what was known to the Greeks and Romans.[2] The gardens have disappeared but their tradition lived on to be exemplified at Granada when, from 1248 to 1492, it was the only surviving Moorish Court in Europe. The two old gardens of the Generalife - Jennat al-Arif (Paradise of the Architect) - upper and lower, remain to exemplify the main types which have profoundly affected Spanish gardening. The lower garden (late thirteenth century), and the Court of the Myrtles in the Alhambra (c. 1334-54) are domestic and inward-looking. A walled courtyard or patio, with open arcaded galleries to give shade, has as its central feature a rectangular pool, alberca, surrounded by low plants in beds or by borders of clipped myrtles or other aromatic shrubs. Such gardens are an integral part of the house and, even of minimal scale, survive in many Andalusian houses such as those in the Calleja de Flores (de la Encarnación) descending towards the Mezquita at Cordova.

The second sort of garden is external - what we regard as the only "garden" - with trees and large shrubs and brightly coloured flowers with penetrating perfumes. The upper garden of the Generalife, perhaps formed when the buildings were redecorated in 1319, used the cypress as its principal tree: the last of the original planting lived for over 600 years. There were also orange trees, sweet bay and possibly palms. The ordinary houses of Granada seen by the Venetian traveller Andrea Navagero (1483-1529) were noted for gardens with pools of water, planted with myrtles, roses and musk roses, the mosquetas celebrated through Spanish literature as in Persian. In the Generalife upper

Riviera garden near Marbella. Photograph by Jules Margottin.

garden the cascade as a device for producing "rumorous sound" and coolth was reduced to runlets in the tops of parapet walls climbing the stairs on the hillside. Maximum effect is produced by minimum expenditure of water.[3]

The adoption by Spain of Moorish gardening as the pattern for Christians was due to Pedro el Justiciero, commonly called King Peter the Cruel (1334-1369), the friend of the Black Prince. Preferring Seville to his northern cities, Pedro rebuilt the Alcázar in 1364-66 and had extensive gardens laid out by Moorish designers and gardeners. Successive campaigns of replanting have in part perpetuated this Moorish garden, though with great additions made for Charles V including a labyrinth and the banqueting-house, the Pabellón de Carlos V of 1543 by Juan Hernández. At the major restoration of 1857 and in more recent work there has been an attempt to preserve the character of these Sevillian layouts of the fourteenth and sixteenth centuries, as well as the later notions such as the <u>burladores</u> or surprise jets of water.[4]

The Moorish garden, adopted at the highest level by the king of Castile, became the pattern for other royal gardens even in the far north of the country. At the great palace-castle of Olite in Navarre, whose architectural ruins survive, there was by the fifteenth century a complete transference of all the features of the oriental paradise from the ancient East. There was a

The Maria Luisa Park, Seville. J.M.

"hanging garden" on a wall supported by arcades and a flat garden laid out with straight walks on a geometrical plan. There were canals and fountains, banqueting-houses and shady galleries, aviaries filled with singing birds and a menagerie of wild animals. The planting included cypress, pine trees, vines, oranges, pomegranates and rare and exotic plants.[5]

In the Renaissance all this became classicised throughout western Europe. Topiary, as in England, became the rage and gardens were filled with sculpture. There were influence from Italy and also from Flanders, the early home of Charles V and source of Spain's economic strength. The greatest private garden in Spain was created for the Duke of Alba (1508-1583) at his country estate of La Abadia (province of Cáceres) before 1577, by a Flemish garden designer. Besides its statuary, some of which survives, the garden was noted for its fantastic topiary, waterworks and grottoes, and its rare plants introduced through Flanders and Germany. Traditional planting with myrtles, lemon and orange trees, and jasmine, formed the framework for this modern art.[6] On a small scale we saw something of this kind, with grotesque carvings and pillars, in the little terraced garden of the Marqués de Salvatierra at Ronda.

Again the lead was taken by the Crown and Philip II, influenced by his sojourn with us as King of England in 1554-58, introduced the English Elm as well as the Oriental Plane in his great planting of Aranjuez begun about 1575.

Duchess of Alba's garden, Seville. Photograph by Peter Hayden.

It was the combination of park, avenues and garden at Aranjuez, "the finest park in the old style in the world" as Loudon called it, that opened the great age of European landscape a century before Versailles.[7] Cervantes in his Persiles of 1615-16 refers to the avenues (calles, "streets") of trees, the rivers, the pools with fish, the flower gardens, the orchards of Aranjuez. Other distinguished writers, Lupercio Leonardo de Argensola (1559-1613) and Baltasar Gracián (1584-1658) were also impressed by the flowers of Aranjuez. In describing the private park of Don Vicencio Juan de Lastanosa at Huesca in northern Aragon, close under the Pyrenees, Gracián showed that it combined the Moorish tradition with some of the new ideas. A pool with swans in it and a "peak" was the centrepiece of a park filled with leafage, perfumes, orange blossom, roses and musk roses, amaranth, lotus and other rare flowering plants.[8]

The avenue, established by Philip II at Aranjuez, was imitated every-

Alcazar, Seville. P.H.

where and was usually planted with poplars (álamos, hence the Spanish alameda for an avenue or mall). An early painting by Velázquez (1599-1660) shows the alameda at Seville, and at Toledo the Paseo de Merchán was planted in 1628. Under Philip IV and later monarchs the royal gardens were much extended and those of La Granja (province of Segovia), begun about 1723, eventually came to rival Aranjuez, though they were in a mainly French style for the French king Philip V and intended to surpass Versailles. La Granja is deservedly famous for its fountains and for the great jet thrown well over 100 feet up on the rare occasions when it plays.

Meanwhile Spain's first botanic garden has been founded near Valencia in 1633, one year after Oxford. Moved to its present site in 1802 the Valencia Garden, after a period of neglect in the last century, is again regarded as the finest in Spain. It was imitated elsewhere and Spanish universities, strong in faculties of Medicine, set up Physic Gardens even on inadequate sites such as that in the middle of Granada, with its fine old gingko. Scientific botany had

Marquese de Viana's garden, Cordoba, P.H.

considerable influence on gardening for the Spanish Empire was sending back its riches from early in the sixteenth century. Not only potatoes and tobacco, but floral treasures such as the "African" marigold reached Europe. Seeds which must have passed through Spanish hands got to the Barbary Coast, to be brought back after the conquest of Tunis in 1535 by the victorious troops of Charles V. Also of mainly aesthetic interest were the annual Sunflower, the lesser Nasturtium (Tropaeolum minus), and Marvel of Peru (Mirabilis jalapa), which had arrived before 1600; the Morning Glory (Pharbitis purpurea) soon afterwards; Tropaeolum majus, in Spain by 1684 and here by 1686; and Alstroemeria pelegrina and Zinnia pauciflora, both introductions of 1753.[9]

In the gardens and parks of Spain as we see them now is an immense exotic flora of quite modern introduction. The climate allows the most unlikely combinations of plants from temperate and tropic zones. In the modest patios of town houses and in window-boxes and balconies, geraniums (Pelargonium cultivars) now predominate, though in the Albaicin of Granada we saw specimens

of the traditional white lily and carnation as well. What were the flowers commonly grown in the south of Spain before 1900? Juan Valera (1827-1905) tells us in his masterly essay "La Cordobesa".[10] Apart from trees: cypress, lemon, orange, plane, poplar, the plants included balsam (Impatiens balsamina), sweet basil, box, butcher's broom, carnation, honeysuckle, ivy, jasmine, spurge laurel (Daphne laureola), Marvel of Peru, passionflower, ranunculus, roses as bushes and as climbers, and the spindle (Euonymus). Along with such planting there was occasional use of rarer trees such as the Magnolia grandiflora, planted with cypresses in 1795, which we saw at the Palacio de Viznar near Granada.

On the Costa del Sol there have long been introductions from England by way of Gibraltar (as if to compensate for our getting Rhododendron ponticum that way), where the Alameda formed in 1814 by Sir George Don (1754-1832) when Governor has always been botanically noteworthy, still more after improvement under Lord Napier of Magdala, Governor in 1876-83. There may also have been influence from the early British colony in Malaga, though the city had always been a botanical centre. The most important encyclopaedic work on medical botany of the Middle Ages, the General Treatise of Remedies and Simples describing 1,400 drugs, was compiled in Arabic by Ibn al-Baitar of Malaga who died in 1248.[11] This tradition survived the reconquest and found expression in the magnificent gardens, in Moorish style, of the former royal palace of Buen Retiro (about six miles west of Malaga), with waterworks and fountains and straight walks of cypress.

The Irishman William Bowles (1705-1780), superintendent of Spanish Mines and author of a natural history of Spain (1775) wrote very truly that "the land of this coast is excellent and its southern climate invites the introduction of plants from America and other hot countries, which would be a boon and delight to Europe". Bowles' suggestion was taken up by Canon Cristõbal Medina Conde and the Royal Botanic Garden had been founded in the Calle de la Victoria before 1789. Medina Conde describes the "Peregrinas of Peru, or Alstroemeria (A. pelegrina) with flowers of various colours, crimson, scarlet, spotted and yellow" growing there splendidly among many other exotic and native plants. A series of disasters interrupted this horticultural advance. Besides the French invasion, appalling epidemics of yellow fever struck Malaga five times in 1801-1821.[12] Charles Waterton (1782-1865), the English naturalist, survived the pestilence of 1803, recording that 50,000 people fled the city and of those who stayed 14,000 died including the uncle with whom he was staying. Waterton describes the horrors of the disease, and of the earthquake which followed.[13] The arts of leisure, including botanical gardening, ceased; but later on burst out with renewed vigour; the magnificent Alameda and the Park running through Malaga are unequalled in the Mediterranean. Thanks to the generous hospitality of Spanish gardeners our party, even in a brief visit, could appreciate the horticultural splendours of the region.

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Notes

[1] V. Lampérez y Romea, Arquitectura Civil Espãnola (1922), I, 412.

[2] J.C. Loudon, Encyclopaedia of Gardening (3rd ed., 1828), 63-64.

[3] Lampérez, op. cit., I, 411-419, gives a good general account with quotations from early writers.

[4] Various guide-books, including Murray's Handbook for Spain (1898), Baedeker (1913), Muirhead's Blue Guide to Southern Spain (1964); J. Guerrero Lovillo, Sevilla (Guías Artísticas de España, 1952), S. Montoto, La Cathedral y el Alcázar de Sevilla (Los Monumentos Cardenales de España, III).

[5] Lampérez, op. cit., I, 411.

[6] Ibid., I, 417-418.

[7] Loudon, op. cit., 65.

[8] Spanish literary references to gardens are mostly from Azorín, El Paisaje de España visto por los Españoles (1917), which also contains his essay "Jardines de España".

[9] A.M. Coats, Flowers and their Histories (3rd ed., 1968); The Quest for Plants (1969).

[10] J. Valera, Obras Completas, vol. 45; extracts are printed by Azorín (see note 8 above).

[11] M. Nakosteen, History of Islamic Origins of Western Education (Boulder, Colorado, 1964), pp. 171, 182, 250.

[12] I am much obliged to the Baronesa de Schlippenbach for telling me of the book of Cristóbal Medina Conde (Cecilio García de la Leña), Conversaciones históricas malagueñas (Malaga, 4 vols., 1789-92), which in vol. I (145-159) gives a list of plants native to the district and an account of those introduced from America and the West Indies. I have also to thank Don Modesto Laza Palacios for kindly sending me a copy of his historical account of the park at Malaga, "Nuestro Parque", from Jábega (revista de Málaga), no. 2, 1974.

[13] C. Waterton's autobiography quoted in introduction to his Wanderings in South America, ed. N. Moore (1891), pp. 18-22.

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Gardening books and plant lists of Moorish Spain, by John H. Harvey

The introduction of plants from one country to another has gone on for several thousand years, and the main movements have been towards the highest centres of civilisation.[1] Thus the expedition of the Chinese general Chang K'ien under Emperor Wu-ti (141-87 B.C.) succeeded in transporting lucerne (as fodder for blood-horses) and the grapevine from Persia in 126 B.C.[2] Pliny tells us of the cherry brought from Pontus to Rome in 68 B.C. Plants of economic importance, medicinal herbs, and flowers sought only for beauty, perfume or rarity, were carried in all directions long before the age of modern science.

Western Europe owes many plants as well as much horticultural technique to the dominion of the Moors in Spain from A.D. 711 to 1492. Under the Western Omayyad Caliphate of Cordova (929-1031) Andalusia was the highest centre of civilisation in the Euro-mediterranean region and produced scientific literature in all fields, linked with the immense Islamic culture in Arabic. Botany, Agriculture and Horticulture, with the Pharmacopoeia, formed branches of a subject eagerly pursued by scholars and by practical collectors and cultivators. Though the debt of Europe, and of modern civilisation, to Arabic science is well known, the importance of the Islamic contribution to horticulture has not been sufficiently recognised.

In Spain, even today, cultivation is at its best in the parts of the country longest under Moorish rule, or which took pains to preserve Moorish methods. Much knowledge was conveyed personally from the Muslims and their baptised descendants the Moriscos to the Christian Spaniards. Long before the expulsions (1492-1609) the Christians were learning from Arabic agricultural literature through translations into Latin and Castilian. Besides, many Christian Spaniards in Aragon, Andalusia, and Toledo were still bilingual. Continuity was preserved both on the scholarly and practical planes. Plants, once introduced, were likely to survive and were carried further into Europe by seeds, bulbs, cuttings or roots, to whatever places were climatically able to grow them. Many of the most important additions to European gardens made since Roman times arrived by way of Moorish Spain.

The peak of introduction came late, after centuries of increasing sophistication. By the ninth century A.D. the cultural centre of Islam was in Persia, Iraq and northern Syria, and the plants in question were mostly native to Iran or long cultivated there. About our King Alfred's time, but nearly three thousand miles away, a new age of science dawned with the establishment (c. 830) of a research institute at Baghdad, largely for the translation into Arabic of works in Greek, Pahlavi, and Indian languages. The chief translators were Hunain ibn Ishaq al-'Abadi (809-877) and his son Ishaq ibn Hunain (d. 910), and among the works translated was the whole of the Materia Medica of Dioscorides.[3] A new Book of Plants was written in Arabic by the Persian al-Dinawari (c. 820-895), "the Father of Arab Botany".[4]

Just when this new knowledge became available it was brought to Spain by Yunus ibn Ahmad al-Harrani, about 880. Al-Harrani, so called from his birthplace Harran (in modern Turkey, between Urfa and the Syrian frontier), an ancient seat of learning, took with him to Cordova drugs and plants as well as advanced botanical information.[5] About this time an extensive compilation on agriculture, quoted by later authorities, was produced by al-Kaldani,[6] born before 912, but of whom nothing is known beyond his great

reputation. During the tenth century Cordova became the main centre of botanical studies on account of an illustrated manuscript of Dioscorides sent in 949 by the Byzantine Emperor Constantine VII Porphyrogenitus (913-959) to the Caliph 'Abdarrahman III (912-961). This book with its coloured pictures of plants excited so much interest that the Caliph obtained from the Emperor in 951 the Arabic-speaking monk Nicholas, able to translate the book and also to teach Greek in public lectures in Cordova, attended even by the prime minister. This was not the end of the story, for under Hisham II (976-1009) an important supplement to Dioscorides on the plants of Spain was written in 983 by the Caliph's physician, Ibn Juljul.[7]

The Golden Age of Cordova was coming to an end, and the Christian reconquest setting in, but the best Andalusian horticulture and its greatest books were still to come. After the end of the Western Caliphate in 1031 Muslim Spain broke up into succession states, the Taifas, the most important being Seville and Toledo. The sultans of both states maintained important palace gardens and the site of that at Toledo, near the railway station, is still known as the Huerta del Rey. What is more, both became genuine botanical gardens, that at Toledo created by Ibn Wafid (999-1075),[8] and carried on after his death by his colleague Ibn Bassal,[9] himself a great botanist, plant collector, and writer on agriculture. Until the Christian conquest of 1085 he was in charge under al-Ma'mun, sultan of Toledo. Later he worked for Sultan al-Mu'tamid (1069-1091) at Seville, where he sowed imported seeds. He had botanised in Sicily, Alexandria, Cairo, Mecca, Khorasan (in northern Persia), and in eastern Spain around Valencia. He told another botanist whom he met in Andalusia that he had seen "the Blue Lily" (susan, an iris) both in Sicily and at Alexandria.

The great importance of Ibn Bassal lies in the survival of the masterly handbook on agriculture and gardening, both scientific and practical, which he dedicated to his royal master al-Ma'mun.[10] The Arabic text has been rediscovered in our own time, as well as an incomplete Castilian translation made c. 1300. The book is thoroughly modern in tone and starts with a discussion of water supply, soils, manures and the choice of ground and its preparation. Particular chapters then give, species by species, methods of planting, pruning and grafting trees, sowing of seeds, and the different classes of vegetables, herbs and aromatic flowering plants and bulbs. In conclusion there is a selection of miscellaneous tips, such as that on the ever-present problem of slugs: "Form your beds, strew on them an inch of ashes from the Public Baths, then lay on your manure and sow the seed; thus the animal mentioned, on leaving the earth in search of the plants, will meet with the ashes and retire confounded."

To us it is the chapters enumerating all the kinds of trees and plants grown, with the appropriate culture of each, that provide the special interest of the book. Their value is increased by the fact that another detailed treatise on Andalusian agriculture survives from the next century, showing a great advance in the number of species in cultivation. This is the Book of Agriculture of Ibn al-'Awwam,[11] printed in time to be used by J.C. Loudon; unfortunately he garbled the author's name as "Ebn-Alwan" and assigned him to the eleventh century, though he wrote late in the twelfth and died about 1200. Ibn al-'Awwam's treatise is on a larger scale than that of Ibn Bassal and is more expressly concerned with transplanting trees and wild plants into

gardens. He adds sections on cattle, horses, poultry and bee-keeping. The lists of plants grown by these two writers are compared in the appendix to the present article.

Before passing on to the cultivated Spanish flora revealed by these authorities, it is worth mentioning a few other writers, though most of their works are lost. In the eleventh century, besides Ibn Wafid and Ibn Bassal, both of Toledo, there was Ibn Hajjaj of Seville, whose compendium on simples, The Sufficiency, was written in 1073-74.[12] The geographer Ibn Amr (died 1094) produced a book on the plants and trees of Andalusia.[13] A little later came al-Tignari,[14] who dedicated a treatise to the prince of Granada, Abu Tahir Tamim (d. 1125). Great medical botanists too were at work: Ibn Zuhr (Avenzoar) who died in 1161; Ibn Bajja (Avempace) of Toledo (d. 1138); and al-Ghafiqi (d. 1166), author of one of the greatest of all mediaeval herbals.[15] To this or a slightly later generation belonged Ibn al-'Awwam. Later still the tradition was carried on by the work of the traveller Ibn Mufarraj (c. 1170-1240) on Dioscorides,[16] and the lost books of Abu al-'Abbas Ahmad al-Nabati ("the Botanist"), born of a Christian mother at Seville about 1170, and known to have studied plants in Spain and throughout North Africa as far as the Red Sea.[17] All this led up to the immense encyclopaedia of Ibn al-Baitar on the medical virtues of plants.[18] Finally, gardening was included in the poem on agriculture ("the Andalusian Georgics") of Ibn Luyun, born at Almeria, who died in 1349.[19]

The two books listing the cultivated plants of Andalusia c. 1080 and c. 1180 show that in one century the number of species had doubled. Though partly due to Ibn al-'Awwam's more thorough treatment, the increase does suggest that there was a real wave of introductions to Spain, or to cultivation, soon after 1100. Many new plants were decorative rather than useful: the Judas Tree, many varieties of Myrtle, the Oleander, Hibiscus, Mallows, and Water-Lilies. Some plants already had numerous cultivated varieties, notably al-khairi, the wallflower (Cheiranthus cheiri), though also including the stock (Matthiola incana). In both books this is said to have eight kinds: the common purple, white, yellow, white and scarlet mingled, a "turquoise", a very brilliant brown, a tawny, and a "sky-blue"; also a small purple wild sort (possibly Moricandia moricandioides*) and the "Water Wallflower", purple and flowering in summer. This last sounds like Sweet Rocket (Hesperis matronalis), but it is hard to say what the turquoise and sky-blue flowers could have been.

There is a similar difficulty over the kinds of lily: white, brown, yellow and sky-blue. The white was certainly Lilium candidum; the brown and yellow may have been Hemerocallis fulva and H. flava, since these were assigned medicinal uses by al-Ghafiqi under their true name in Arabic guise: Imaruqalis.[20] The blue lily was almost certainly an iris since the Arabic susan, Spanish azucena, had that primary meaning. On the other hand, "the small blue lily" is separately described as an iris. The white narcissus "with a small yellow circle in the middle" is clearly described, and al-'Awwam gives the standard cultural hint: "Some persons dedicated to the knowledge of floriculture say that when the leaves of this bulb have dried, as

* Mr Richard Gorer's suggestion.

happens during the summer, it should then be taken up and stored until the time comes for planting, viz. in September".[21] The violet comprised only two kinds, the wild and the cultivated, grown at Seville and Cordova. "Seed should be sown on sheltered shady beds, and also in new flower-pots, perforated (for drainage), after putting on the surface of the bed or pot some crumbled brick-dust from an old wall or similar material, mixed with an equal amount of pigeon's dung".[22]

The deliberate naturalisation of wild plants forms one of the most significant features of gardening as practised by al-'Awwam. He tells us: "Bell-ivy (Bell-bind, perhaps Calystegia sepium or Convolvulus spp.) is a wild plant called Poor Man's Cord, with a beautiful flower. It is like a small kind of ivy. The ivy called kissus (Hedera spp.) is a wild plant which climbs trees and hangs down from them. Both these may be moved to gardens, taking them up with their roots in February, and planted near the water-channels they are watered from time to time until they become established. For these climbers one makes a trellis of stakes on which both kinds climb and are sustained".[23]

Although most of the plants in both books can be identified, at least as to genus, there are several difficulties. Generally these are due to confusion of nomenclature, coming from Greek, Persian and Arabic sources, of exactly the same kind that beset all pre-Linnean botany.[24] Sometimes the problem merely concerns the particular species of a known group such as the mallows: there were shrubby forms (probably Hibiscus syriacus), marshmallow and or hollyhock, and several varieties of mallow. There is doubt as to whether the "glaucous poppy" was a Glaucium, a Hypecoum, or even Chelidonium majus. "Lavender" is not specific. A plant described as a yellow ox-eye might theoretically be a Buphthalmum but was perhaps more probably Asteriscus maritimus. The sorts of jasmine included a purple one, which may have been some unrelated plant of similar habit, perhaps Periploca graeca. There was a "Macedonian bulb", thought by Clément-Mullet to be the Iris macedonica of Pliny (probably I. variegata).[25] Problems of the "Lily" have already been discussed. Among the vegetables there is the kidney-bean, linquistically indistinguishable from modern products of the genus Phaseolus, though all our garden kidney-beans are now believed to come from America. Ibn al-'Awwam refers to 12 varieties, showing that the plant had long been in cultivation before the twelfth century: probably it was Dolichos lablab.[26]

The varieties of the rose are said by al-'Awwam to include a blue rose and roses yellow without and blue within, and blue without and yellow within, the last particularly common at Tripoli in Syria. There may have been two different sources of confusion: the use of "rose" (as with Christmas Rose) to describe unrelated plants such as hibiscus; and a mistake of "blue" for red, in which case the roses of mixed colour could be forms of Rosa foetida bicolor. The Chinese rose (ward al-sini) may have been Hibiscus rosa-sinensis, but it is conceivable that Rosa chinensis or one of its hybrids had already reached the West, to give rise to some of the remontant roses available before the eighteenth century.[27]

Besides the many cultivated roses there was the wild dog-rose, commonly called nisrin in Arabic.[28] The "nisrin", however, is described as a bulbous plant in two sorts, white and yellow, with a very sweet scent and a hanging flower. The bulb is small and grows in meadows; the flowers come out in

October and are the first flowers of the season to spring from the earth.[29] This, of course, implies the logical season of the "farmer's year" starting from the autumnal equinox. From the description Mr Richard Gorer suggests that these were colour forms of Narcissus tazetta or related species. From literary, as distinct from horticultural and botanical sources, Mr James Dickie has drawn up a parallel list of some 50 plants grown in Andalusian pleasure gardens of the eleventh and twelfth centuries.[30]

Did we benefit from this modern gardening in the Spain of eight or nine centuries ago? Yes, but indirectly. From 1085 Toledo, from 1236 Cordova, from 1248 Seville belonged to Castile. Valencia and its rich huerta were taken for the realm of Aragon in 1238. Granada, though Muslim until 1492, was tributary to Castile and often an ally of the Christian Castilians. We know that Englishmen stayed in Spain and brought back Arabic science - notably Adelard of Bath c. 1120, when he collaborated with the converted Jew Petrus Alphonsi from Aragon, later physician to Henry I. Daniel de Morley, who studied at Toledo under Gerard of Cremona (1114-1187), returned to England "with a precious multitude of books" about 1185.[31] England and Spain remained politically very close until after 1500. Another main route for scholarly information was by way of Montpellier in southern France, where a medical school was founded by Arab and Jewish physicians from Spain in the twelfth century and incorporated in 1221; the University was founded in 1289. From 1204 to 1349 the lordship of Montpellier belonged to the Crown of Aragon and it was thus an outpost of Spanish influence.[32] It is of interest that the Botanic Garden, founded in 1593, is the oldest in France and earlier than any of the post-mediaeval gardens in England or Spain.[33]

The plants whose cultivation is detailed in the books of Ibn Bassal and Ibn al-'Awwam have been rearranged in main categories and put into alphabetical order (see below). In a few instances plants have been repeated in parenthesis when they belong notably to more than one class; but it can be assumed that medicinal uses were assigned to practically all plants in every category. In addition to the plants listed, Ibn al-'Awwam described the cultivation of the cereals Barley, Millet, Italian Millet, Rice, Wheat, Summer Wheat (Triticum dicoccum), and Zeocrithon.[34]

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Appendix: Plants cultivated in Southern Spain, c. A.D. 1050-1200

Scientific names are in most cases according to the Royal Horticultural Society's Dictionary of Gardening, 1956/1965.

Ibn Bassal, c. 1080	Ibn al-'Awwam, c. 1180
	FRUITS AND NUTS
*Almond	*Almond
*Apple	*Apple
Apricot	Apricot
	Azarole (Crataegus azarolus)
	*Banana (Musa sp.)
	Bramble
	*Carob (Ceratonia siliqua)

Ibn Bassal, c. 1080	Ibn al-'Awwam, c. 1180
FRUITS AND NUTS continued	
*Cherry	*Cherry, Black and Red
Chestnut (Castanea sativa)	Chestnut
Citron	Citron
*Date Palm (Phoenix dactylifera)	*Date Palm
*Fig	*Fig
*Grapevine	*Grapevine
Hazel and Filbert	Hazel and Filbert
	Jujube(Zizyphus jujuba)
	*Lemon
	Lotus (Celtis australis)
	*Medlar (Mespilus germanica)
Melon	Melon
*Mulberry, White (Morus alba)	*Mulberry, White
Olive	Olive
*Orange	*Orange
Peach, Clingstone, Freestone	Peach
*Pear	*Pear
Pistachio (Pistacia vera)	Pistachio
*Plum	*Plum
*Pomegranate (Punica granatum)	*Pomegranate, and wild sort*
*Quince	*Quince
	(Sebesten) (Cordia myxa)
Service (Sorbus domestica)	Service
	Shaddock (Grape Fruit)
Walnut (Juglans regia)	Walnut
Water Melon	Water Melon, two sorts
FOREST AND ORNAMENTAL TREES AND SHRUBS	
	Acacia (Acacia arabica)
?Althaea, shrubby	Althaea (Hibiscus syriacus)
Arbutus (Arbutus unedo)	Arbutus
Ash (Fraxinus sp.)	Ash
	(Azarole)
Azedarach (Melia azedarach)	Azedarach
*Bay (Laurus nobilis)	*Bay
	Buckthorn (Rhamnus cathartica)
	Butcher's Broom (Ruscus sp.)
(Chestnut)	(Chestnut)
*Cypress (Cupressus sempervirens)	*Cypress
"Elm, Black") (? Poplars	
" " White") Populus spp.*)	
	Hawthorn (Crataegus spp.)
	Ivy (Hedera helix)
	*Jasmine (Jasminum officinale)
	* " Yellow (J. fruticans)
	" Purple (? Periploca graeca*)

Ibn Bassal, c. 1080	Ibn al-'Awwam, c. 1180
FOREST AND ORNAMENTAL TREES AND SHRUBS continued	
	Judas Tree (Cercis siliquastrum)
	*Lavender (Lavandula spp.)
	*Myrtle (Myrtus communis)
Holm Oak (Quercus ilex)	Holm Oak
	*Oleander (Nerium oleander)
	"Palm, small, called 'Kadi'" (? Pandanus tectorius)
Pine (Pinus pinea?)	Pine
	Plane (Platanus orientalis)
	Reed(Arundo donax?)
Rose (Rosa spp.)	Rose
Rue (Ruta graveolens)	Rue and Wild Rue
	Sebesten (Cordia myxa)
(Service)	(Service)
(Walnut)	(Walnut)
	*Willow (Salix spp.)
FLOWERS AND HERBS	
Anise (Pimpinella anisum)	Anise
	Anise, Wild (Daucus gingidium)
Balm (Melissa officinalis)	Balm
*Basil (Ocimum basilicum)	*Basil
*Bindwind (? Calystegia sepium)	*Bindweed
	(Butcher's Broom)
*Camomile (Anthemis nobilis)	*Camomile
Caraway (Carum carvi)	Caraway
? Celandine, Greater (Chelidonium majus)	? Celandine, Greater
*Colocasia (Colocasia antiquorum)	*Colocasia
*Colocynth (Citrullus colocynthis)	*Colocynth
Coriander (Coriandrum sativum)	Coriander
Cumin (Cuminum cyminum)	Cumin
	Dill (Peucedanum graveolens)
	Dragons (Dracunculus vulgaris)
	Elecampane (Inula helenium)
	Fennel(Foeniculum vulgare)
	Fumitory (Fumaria officinalis)
	? Hellebore, Black
	Henbane (Hyoscyamus niger)
	Hibiscus (H. rosa-sinensis)
	Hollyhock (Althaea rosea?)
	*Iris (Iris spp.)
	('Macedonian bulb'? I. variegata*)
	(Lavender)
Leadwort (Plumbago europaea)	
*Lily (Lilium candidum)	*Lily
	Mallow, Cordova)
	" Garden)- (Malva spp.)
	" Sicilian)

Ibn Bassal, c. 1080	Ibn al-'Awwam, c. 1180
FLOWER AND HERBS continued	
*Mandrake (Mandragora officinarum)	
*Marjoram (Origanum majorana)	*Marjoram
	" Wild (Origanum vulgare)
Marshmallow (Althaea officinalis)	Marshmallow
	Marum (Teucrium maru?)
Melilot (Melilotus officinalis)	Melilot
	*Mint (Mentha spp.)
*Narcissus, White	*Narcissus, White and Yellow*
* " Yellow	
	"Nisrin" (Narcissus tazetta?*)
Nigella (N. sativa)	Nigella
	Ox-eye, White (Anacyclus valentinus?)
Ox-eye, Yellow (Asteriscus maritimus*?)	Ox-eye, Yellow
	(Parsley - see VEGETABLES, Celery)
	Plantain (Plantago spp.)
	*Poppy, White (Papaver somniferum)
	Rocket (Eruca sativa)
*(Rose)	*(Rose)
(Rue)	(Rue)
*(Saffron)	*(Saffron)
	Savory (Satureia sp.)
	"Squill, Lesser" (Pancratium maritimum?)
*Violet (Viola odorata)	*Violet
*(Wallflower (Cheiranthus cheiri)	*Wallflower
*(and Stock (Matthiola incana)	*Stock
	*Water Lily, White (Nymphaea alba)
	" " Red (--var. rubra)
	" " Yellow (Nuphar lutea)
Wormwood (Artemisia absinthium)	Wormwood
VEGETABLES AND SALADS	
	Artichoke (Cynara scolymus)
Asparagus	Asparagus
	*Bean, Broad (Vicia faba)
	" Kidney (Dolichos lablab?)
Blite (Chenopodium capitatum)	Blite
Cabbage and Roman Cabbage	Cabbage
Carrot	Carrot
Cauliflower	Cauliflower
	Celery (? also Parsley)
	Chick Pea (Cicer arietinum)
	Chickling Pea (Lathyrus sativus)
	Cress
Cucumber	Cucumber

Ibn Bassal, c. 1080	Ibn al-'Awwam, c. 1180
VEGETABLES AND SALADS continued	
Egg-plant (Solanum melongena)	Egg-plant
(? Chicory or Endive)	Endive
	Fenugreek (Trigonella foenum-graecum)
Garlic	Garlic
	Gherkin
Gourd	Gourd
Leek	Leek
	Lentil (Lens esculenta)
Lettuce	Lettuce
	*Lupin (Lupinus albus)
Onion	Onion
	Orach (Atriplex hortensis)
	"Parsnip" (Pastinaca dissecta)
	Pea
Purslane (Portulaca oleracea)	Purslane
Radish	Radish
	Sorrel (Rumex acetosa)
Spinach (Spinacia oleracea)	Spinach
Spinach Beet (Beta vulgaris cicla)	Spinach Beet
Turnip	Turnip
ECONOMIC PLANTS	
Caper (Capparis spinosa)	Caper
	Chufa (Cyperus esculentus)
	Clover (Trifolium alexandrinum)
	Cotton (Gossypium arboreum)
	*Flax (Linum usitatissimum)
	Hemp (Cannabis indica)
	Henna (Lawsonia inermis)
	Indigo (Indigofera tinctoria)
	Lucerne (Medicago sativa)
Madder (Rubia tinctorum)	Madder
	Mustard (Sinapis alba)
Nigella (N. sativa)	Nigella
Pepper (Piper nigrum)	
	Safflower (Carthamus tinctorius)
Saffron (Crocus sativus)	Saffron
Sesame (Sesamum indicum)	Sesame
	Sugar Cane (Saccharum officinarum)
	Sumach (Rhus coriaria)
	Tares (Vicia spp.)
	Teasel (Dipsacus fullonum)
	Woad (Isatis tinctoria)

* See note 30.

** The proposed identifications marked thus have been made by Mr Richard Gorer, who kindly allows me to include them.

* * * * * *

Acknowledgments

I am greatly obliged to Dr Derek Latham for providing me with an extensive list of books and editions of texts, as well as for other help; and to Miss M. Winder for detailing where many rare works might be seen in London. Dr Latham has also read a draft of this paper. Mr Richard Gorer has contributed to the proposed identifications from his botanical knowledge both of the history of cultivated plants and of the flora of Andalusia and the Mediterranean. To the libraries of the Wellcome Institute for the History of Medicine; the School of Oriental and African Studies, University of London; the India Office; the Royal Botanic Gardens, Kew; and the Royal Horticultural Society I am grateful for generous hospitality and much help. My personal thanks go also to Mr R.G.C. Desmond, Mr V.T.H. Parry and Dr C.H. Talbot.

Notes

1 A.M. Coats, The Quest for Plants (1969); K. Lemmon, The Golden Age of Plant Hunters (1968), pp. 2-4.

2 B. Laufer, Sino-Iranica (Chicago, Field Museum Anthropological Series, XV No. 3, 1919), 210, 221. Laufer shows that several other plants allegedly introduced to China by Chang K'ien did not arrive until much later.

3 De Lacy O'Leary, How Greek Science passed to the Arabs (1949), pp. 164-169; M. Nakosteen, History of Islamic Origins of Western Education (Boulder, Colorado 1964).

4 Abu Hanifa Ahmad ibn Da'ud al-Dinawari. A modern edition was begun by B. Lewin (Uppsala, Wiesbaden 1953); continued in Bibliotheca Islamica, 26 (1974).

5 M. Meyerhof, "Esquisse d'histoire de la pharmacologie et botanique chez les musulmans d'Espagne", Al-Andalus, III (1935), 1-41; O'Leary, op. cit., pp. 172-175.

6 Abu Bakr Ahmad ibn Ali ibn al-Wahshiyya al-Kaldani (Nakosteen, p. 274).

7 Abu Da'ud Sulaiman ibn Hassan ibn Juljul (O'Leary, op. cit., p. 171; Nakosteen, p. 252).

8 Abu-l-Mutarrif 'Abd al-Rahman ibn Muhammad ibn 'Abd al-Kabir ibn Yahya ibn Wafid al-Lakhmi (Abenguefidh). He wrote a treatise on agriculture of which a fourteenth-century Castilian translation survives (J.M. Millás Vallicrosa, Al-Andalus, VIII, 1943, 281-332); cf. L. Faraudo de Saint-Germain, El Libre de les Medecines Particulars (Barcelona 1943), p. viii.

9 Abu 'Abd Allah Muhammad ibn Ibrahim ibn Bassal al-Tulaytuli (of Toledo).

10 Ibn Bassal, Libro de Agricultura, edited with Spanish translation by J.M. Millas Vallicrosa and M. Aziman (Tetuan, Instituto Muley el-Hasan 1955); cf. Millás Vallicrosa, Al-Andalus, XIII, 1948, pp. 347-430.

[11] Abu Zakariya Yahya ibn Muhammad ibn Ahmad ibn al-'Awwam al-Ishbili (of Seville). The manuscript survived in the Royal Library at the Escorial and extracts were translated in 1751 by command of Ferdinand VI (1746-1759). The whole book was published in parallel Arabic text and Spanish translation by J.A. Banqueri, a canon of Tortosa (2 vols. Madrid 1802). A French translation, with improved identifications, was made by J.J. Clément-Mullet, Le Livre de l'Agriculture d'Ibn al-Awam (2 vols., Paris 1864-67).

[12] Abu-l-Khair Ahmad ibn Muhammad ibn Hajjaj al-Ishbili (E. García Gómez, Al-Andalus, X, 1945, p. 137). Millás Vallicrosa called him Abu-l-Khair al-Shajjar al-Ishbili (Al-Andalus, XX, 1955, p. 101), distinguishing him from Abu 'Umar ibn Hajjaj (Nakosteen, p. 274).

[13] Abu 'Ubaid 'Abd Allah ibn 'Abd al-'Aziz ibn Muhammad ibn Aiyyub ibn Amr (Nakosteen, p. 235).

[14] Abu 'Abd Allah Muhammad ibn Malik al-Tignari, born in the neighbourhood of Albolote, close to Granada (E. García Gómez, Al-Andalus, X, 1945, p. 137; J.M. Millás Vallicrosa, ibid., XIX, 1954, pp. 129-142).

[15] M. Asín Palacios, Al-Andalus, V, 1940, 255-299. There seems to be some confusion between Zuhr (d. 1131) and Ibn Zuhr (d. 1161); cf. Nakosteen, pp. 255-256. Part of an abridgement of The Book of Simple Drugs of Abu Ja'far Ahmad ibn Muhammad al-Ghafiqi was edited and translated by M. Meyerhof and G.P. Sobhy (Cairo, Egyptian University, Faculty of Medicine, Publication No. 4, 4 fasc., 1932-40).

[16] Abu al-'Abbas Ahmad ibn Muhammad ibn Mufarraj (Nakosteen, p. 257).

[17] Nakosteen, p. 171, and information kindly sent by Dr Derek Latham.

[18] Abu Muhammad 'Abd Allah ibn Ahmad ibn al-Baitar Dhiya al-Din al-Malaqi, born at Malaga and died 1248 at Damascus. His great work was translated into German by Joseph von Sontheimer (2 vols., Stuttgart 1840-42), and into French by Lucien Leclerc (Notices et Extraits des manuscrits de la Bibliothèque Nationale, XXIII, XXV, XXVI, Paris, 1877-83).

[19] Abu 'Uthman ibn Luyun al-Tujibi; see E. García Gómez, Al-Andalus, X, 1945; Nakosteen, p. 258. Ibn Luyun's general precepts for garden design and planting are translated by Mr James Dickie at pp. 240-241 of his article "The Hispano-Arab Garden - its Philosophy and Function", Bulletin of the School of Oriental and African Studies, XXXI, 1968, pp. 237-248.

[20] Meyerhof and Sobhy (above, note 15), p. 130, No. 42.

[21] ed. Banqueri, II, p. 275; ed. Clément-Mullet, II, p. 265.

[22] ibid., II, pp. 280/270.

[23] ibid., II, pp. 321/312.

[24] This was particularly due to the medicinal use of substitutes for unobtainable drugs, whose names were transferred (M. Levey, Substitute Drugs in Early Arabic Medicine, Veröffentlichungen der Internationalen Gesellschaft für Geschichte der Pharmazie, NF, Band 37, Stuttgart 1971).

[25] Clément-Mullet (above, note 11), II, 267.

[26] See M. Levey, The Medical Formulary of Al-Kindi (Madison, University of Wisconsin Press 1966) p. 331.

[27] On the rose see C.C. Hurst in Graham Thomas, The Old Shrub Roses (4th ed., 1963); and R. Gorer, The Development of Garden Flowers (1970), pp. 87-105.

[28] M. Levey & N. al-Khaledy, The Medical Formulary of Al-Samarqandi (Philadelphia 1967), p. 230.

[29] Ibn al-'Awwam, II, 279/269.

[30] See above, note 19. The literary list is considerably shorter than the technical-scientific one, as might be expected, but it is noteworthy that it includes the trumpet daffodil (narjis qadushi) and the carnation (qaranful), and what may be the red anemone or a poppy (shaqir, or shaqiq al-nu'man), as well as acanthus and thyme, as additions. The 'literary' plants are marked with an asterisk* on our lists.

[31] A.B. Emden, A Biographical Register of the University of Oxford to A.D. 1500, II (1958), 1315; for Adelard and the general background see C.H. Haskins, Studies in the History of Mediaeval Science (New York 1924/1960).

[32] The famous king of Aragon, Jaime I el Conquistador (1208-76), was born at Montpellier.

[33] For the Jardin des Plantes at Montpellier see Gardener's Chronicle, 4 January 1964.

[34] Chapter xx.

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JOHN H. HARVEY

GARDEN PLANTS OF MOORISH SPAIN: A FRESH LOOK

THE OUTSTANDINGLY successful tour of gardens in Andalusia by the Garden History Society in the early summer of 1974 led to reconsideration of the history of gardening in Spain and to a preliminary exploration of the vast literature in Arabic which in part survives from the Middle Ages.[1] This was necessarily superficial, particularly because of the rarity of the printed sources, which include texts translated into Spanish, French, German or — minimally — English. Now that more than fifteen years have elapsed the available bibliography has been notably enlarged. Late in 1975 appeared the long-awaited edition, with Spanish translation, of the *Treatise of Agriculture* by Ibn Luyūn, the famous 'Andalusian Georgics' of A.D. 1348.[2] This notable work crowned the career of the late Sra Joaquina Eguaras Ibáñez and laid open to the world a remarkable summary of the agricultural and horticultural knowledge of its time. Comparison with the almost exactly contemporary English 'Feate of Gardening' — also in verse — gives convincing proof of the relatively advanced state of the art in Muslim Spain as compared with that of north-west European Christendom.[3]

Perhaps even more important has been the recent publication by the Spanish government of a facsimile edition of the immense book of Ibn al-ᶜAwwām, dating from about 1180.[4] As an edition of the Arabic text, with a complete Spanish translation, this was originally published in 1802 by the Royal Library of Madrid, the outcome of many years of patient scholarship by José Antonio Banqueri, Canon of Tortosa. It was Banqueri's work that first displayed to the modern world the riches of horticultural knowledge which, for centuries, had lain buried in a very few ancient Arabic manuscripts. Within twenty years some of its information had reached Britain, where J. C. Loudon quoted 'Ebn-Alwan' as showing in his list that by the eleventh century (*sic*; really twelfth) the sorts of garden plants were 'more numerous than those which were cultivated by the Greeks and Romans'.[5] This important observation none the less did little to modify the tendency, in our relevant literature, to belittle the Arabic contribution to gardening. It is only within the last few years that there has been a notable reversion to an objective view of garden history.[6] Loudon's estimate of the important advances made

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by Moorish gardening is borne out statistically: only some 76 of the 157 or so plants in Ibn al-ᶜAwwām are found in Palladius (*c.* A.D. 380): the classical flora had been greatly increased.

The European herbals of the earlier Middle Ages contained a modest number of plants, for instance the 77 species included in the famous list of 'Macer Floridus', probably compiled in the first half of the eleventh century, of which about twelve were imported drugs not then known as living plants in western Europe.[7] By the time that the herbal attributed to Macer had achieved a general circulation its total had risen to 103 plants and imports in all. This was roughly equal to the number of different species cultivated at the court of Charlemagne (*c.* A.D. 800),[8] and also in the English lists of Henry the Poet (Henricus Anglicus) about 1300,[9] and of Master John Gardener (*c.* 1350).[10] It was not until Henry Daniel, about the same time, formed his botanical garden at Stepney beside London, with 252 different sorts of herbs, that there was a marked increase in the garden flora of northern Europe.[11]

Naturally there were substantial differences between the northern and southern floras for climatic reasons. On the other hand many food crops and physic herbs could be grown throughout Europe and the Mediterranean region. In fact 35 of the 100 species of plants listed by Master John Gardener in England were also among the plants grown in Moorish Spain between the tenth and the fourteenth centuries. Of the much longer list of 258 plants in the gardens of northern Europe (*c.* 800–1538), some 107 occur in the combined list of Moorish plants of Spain (*c.* 975–1348).[12]

The plants grown in Andalusia obviously included a considerable number which could not normally have been grown in the north in the open air: banana, caper, carob, colocynth, cotton, date-palm, henna, jujube, myrtle, oleander, olive, orange and other citrus fruits, pistachio, sesame, sugar-cane, watermelon. Other plants, reasonably or even perfectly hardy in England, were slow to arrive for reasons which it is hard to understand. Among these anomalies the chief is the cauliflower, an esteemed vegetable throughout the Near East and the Mediterranean well before the year 1000, yet unknown in Britain until the sixteenth century. Among fruits the apricot did not reach us until after 1540, though the peach was here by the thirteenth century. The azarole was another fruit tree which arrived late, and among ornamental plants the white jasmine and the Judas tree, neither of which appeared until the sixteenth century.[13]

Reverting to southern Spain, the interesting survival of the *Cordova Calendar* throws light on the garden flora at the height of the Omayyad Caliphate in the reign of al-Ḥakam II (al-Mustanṣir) in A.D. 961–76.[14] Though not primarily a garden book, but a weather almanac combined with a calendar of the Christian holy days of Spain, this lists a large number of fruit trees and crop plants with the dates for sowing or planting, and of the harvest. Again, the total number of plants is roughly 100, and it is of considerable significance that some of them are of ornamental rather than utilitarian interest.[15]

The number of sorts of plants grown steadily increased, as can be estimated by counting those mentioned in the three later source-books, of Ibn Baṣṣāl, Ibn al-ᶜAwwām, and Ibn Luyūn. Ibn Baṣṣāl, writing in Toledo about 1075–80, mentioned some 100 plants, but in a more complete edition quoted by Ibn al-ᶜAwwām (and perhaps compiled at Seville after 1085) there are another twenty-four species or varieties. Ibn al-ᶜAwwām, at Seville about 1180, names nearly 160 plants, and Ibn Luyūn of Almeria in 1348

roughly maintained this.[16] These totals were, of course, only of those trees and herbs regarded as worth growing, whether for practical or aesthetic reasons.

Between the tenth and eleventh century several noteworthy trees made their appearance as garden plants in Spain: the ash, the bead-tree (*Melia azedarach*), cypress, orange, two sorts of poplar and the arbutus; with a considerable number of culinary herbs, salads and condiments: caper, caraway, chufa, coriander, cumin, endive, parsley, orach, pea, savory, sesame, spinach, together with the industrial crops teasel and woad. Several highly decorative plants for the pleasure garden: the blue Morning Glory, forms of iris, the Madonna lily, wallflowers and stocks, and waterlilies were first listed, and medicinal plants too increased in number. This rapid expansion of the garden flora continued until the end of the twelfth century, but then virtually ceased, though the versified treatise of Ibn Luyūn perhaps does not provide a fair comparison with the massive encyclopaedia of Ibn al-ᶜAwwām. What can be said is that the four main sources available provide a consistent picture of what was being grown.

The identity of most of the listed plants is not in doubt, as many early Arabic dictionaries and herbals give comprehensive lists of synonyms. There is, however, a residue of species which cannot be precisely identified. It will be convenient to consider these here in the alphabetical order of English names, to correspond with the overall list (see Appendix). Hereafter the abbreviations C.C. for *Cordova Calendar*; I.A. for Ibn al-ᶜAwwām; I.B. for Ibn Baṣṣāl; I.L. for Ibn Luyūn, are employed.

Wild ANISE, **tamak**, was identified by Clément-Mullet as *Daucus gingidium* L.[17] I.A. quotes I.B. and others as stating that it was grown in the same way as fennel, and used like garden anise.

Kidney BEAN, **lūbiyā**, might be of more than one species, but *Vigna cylindrica* (L.) Skeels (*unguiculata*) is the most probable, though *Dolichos lablab* L. was probably grown as well.

BINDWEED, **liblāb**, was of four kinds according to I.B.: one with white flowers grown as a laxative physic herb, which should be *Convolvulus scammonia* L. Another with white flowers growing among bushes must surely be the very common *Calystegia sepium* (L.) R.Br.; but another wild form, with small white flowers, is likely to have been some unrelated climber such as *Cynanchum acutum* L., which on account of its scent might well have been grown in pleasure gardens. The fourth species, with a blue flower, was certainly *Ipomaea nil* (L.) Roth.

BOXTHORN, **ᶜausaj**, as described by I.A., was a spiny *Lycium* used for hedges, very likely *L. europaeum* L. There is, however, confusion in both ancient and medieval sources, with buckthorn, *Rhamnus* spp.

BUGLOSS, **lisān al-thaur**. This was certainly a boraginaceous plant, quite probably an *Anchusa*, but it figures only in the *Cordova Calendar* as flowering in April.

CLOVER, **qurṭ**, should normally mean *Trifolium alexandrinum* L., but in the Latin version of C.C. it is equated with '*alfasfasa*', lucerne, *q.v.*

DODDER, **kushūthā**, mentioned as being gathered as a simple in June, might be one of several species of *Cuscuta*, found widely as a parasite on other plants.

ELECAMPANE, appears both as **rāsin** and **janāḥ**, but the sources agree that these are synonyms for *Inula helenium* L.

HOUSELEEK, **hayy al-ᶜālam**, would in the Mediterranean region imply the tree houseleek, *Aeonium arboreum* (L.) Webb & Berth., as illustrated in the Vienna Codex of Dioscorides.[18]

IRIS, **īrīs, sūsan**, cannot be specified but normally included several distinct rhizomatous flags, *Iris florentina* L., *I. foetidissima* L., *I. germanica* L. and *I. pseudacorus* L. There is serious confusion with the genus *Lilium*, as the Arabic **sūsan** came to mean in Spanish usage *L. candidum* L. (*azucena*).[19]

The 'Macedonian bulb', **basal al-maqdūnis**, was possibly *Iris variegata* L.[20]

LUCERNE, **fiṣfiṣah**, *Medicago sativa* L., was certainly cultivated by I.A. and I.L., and presumptively much earlier at Cordova (see clover, above).

MALLOW, **mulūhīyā**, is primarily *Malva sylvestris* L. and *M. neglecta* Wallr. (*rotundifolia*), but includes several other species. The Arabic name **khaṭmī** likewise includes several different sorts of larger mallows: marshmallow, *Althaea officinalis* L.; the tree mallow, *Lavatera arborea* L.; the shrub mallow or Syrian ketmia, *Hibiscus syriacus* L., as well as the oriental hollyhock, *Alcea rosea* L.

MARIGOLD. In C.C. a plant called (**al-**)**bahār** in Arabic and in Latin *albear* was said to be in flower in December. The early sources equate this with the Latin *buphthalmum*, 'ox-eye', but as that is also said to have a flower red in the centre with yellow petals, the most likely identification is with *Calendula officinalis* L.

MARUM, **marw**, might mean one of several labiate plants, but is most probably Origan of Egypt, *Origanum maru* L.

MILK-VETCH, **baram**, is quoted from I.B. in I.A., but described as a form of 'Acacia' similar to the lupin, with a sweet white flower. Richard Gorer suggests that this agrees with *Astragalus lusitanicus* Lam., the Iberian milk-vetch.[21]

NARCISSUS. The generic term **narjis** refers to the common spring-flowering species, of which many are native to Spain, but the bulb described as **nisrīn**, flowering in autumn, appears to be *Narcissus elegans* Spach; and the bulbous **bahār ābyaḍ** appears to refer to *N. papyraceus* Ker-Gawler.

PARSLEY. The Arabic **karafs** is an ambiguous term, used for smallage and celery, forms of *Apium graveolens* L., as well as for parsley, *Petroselinum crispum* (Miller) A. W. Hill. It is probable that both plants were grown (see also SMALLAGE).

'PARSNIP', **shaqāqul**, is most probably *Pastinaca schekakul* Russ., but might include various related plants such as skirret, *Sium sisarum* L.; and forms of the true parsnip, *Peucedanum sativum* Bentham.

POLY, **jaᶜdah**, is strictly *Teucrium polium* L., but this seems unlikely in the context of C.C., where the reference is to the seasonal growth of greenstuff on the soil of Arabia in January. Richard Gorer suggests that species of *Artemisia* are more likely. In any case the reference is to a wild plant not grown in gardens.

POPLAR. In the medieval Castilian version of I.B. (Book V, pp. гюююю, гюй) there are references to black and white 'elms', *olmos negrales* and *olmos aluares*, but the Arabic is lost. It is probable that this is a mistake for **álamos**, poplars, and this is confirmed by I.L., which refers to the **nashm āswad** (black poplar) and **nashm ābyaḍ** (white poplar), presumably *Populus nigra* L. and *P. alba* L.

SILK-VINE, **yāsamīn urkhuwānī** or 'purple jasmine' is probably *Periploca graeca* L., but it is also possible that *Syringa persica* L., Persian jasmine (lilac) is meant.

SMALLAGE, **karafs**, the wild plant from which celery was developed (*Apium graveolens* L.). The Arabic sources confuse it with parsley (q.v.).

White THISTLE, **bādāward**, is said in C.C. to be a simple gathered in August. The name is in origin Persian but its identity was disputed in the early sources, though it seems to have been accepted that it was some form of thistle or related plant, with a thick tall stalk and violet flowers. It has also been identified as *Volutarella divaricata* Bentham.

WOAD, **ḥabaq al-ᶜajab**. The plant concerned was a blue dye-stuff, probably not indigo, and therefore likely to be *Isatis tinctoria* L. In I.A. this is confused with bindweed (q.v.)

because of the use of **nīl** (indigo) in both names (**ḥabb al-nīl**, the blue-flowered Morning Glory, *Ipomoea nil* (L.) Roth.).

It may be useful to comment on the appearance of some of the more interesting garden plants, here again arranged in alphabetical order of their English names.

ARTICHOKE, **kharshaf**, is found in I.A. before the end of the twelfth century, roughly at the same time that it is mentioned by Abbess Hildegard in Germany.

ASPARAGUS, **halyūn, āsfarāj**, is described as of two kinds, wild and garden, but I.B. also refers to the transplanting of the wild sort into the garden to improve it. The asparagus of classical times, described by Theophrastus and Dioscorides, was the spiny *A. acutifolius* L.; but that of cultivation since the Middle Ages is *A. officinalis* L. It seems probable that the Moors discovered the superiority of this latter species, which is herbaceous.[22]

BEAN, KIDNEY, **lūbiyā**, was widely grown throughout the South, though quite unknown in north-west Europe (see above).

CAULIFLOWER, **qannabīṭ**, appears consistently through the Spanish lists, and was well known throughout the Near East and North Africa. Its very late transference to north-west Europe remains a puzzle.

HEMP, **qinnab**, does not appear until the twelfth century, although well known in classical times.

HOLLYHOCK, **khaṭmi**, appears in I.A. and seems to have reached England late in the thirteenth century from Spain, probably introduced by Eleanor of Castile, the queen of Edward I. As a highly ornamental plant, remarkably hardy in the North, it is one of the earliest additions to the strictly ornamental garden flora.[23]

LEMON, **līmūn**, was one of the later citrus fruits to appear in western Europe, in the twelfth century.

MEDLAR, **zuᶜrūr**, though well known in classical times, seems to have been relatively late in appearing in the southern garden flora.

PEA, **julbān**, was a very ancient crop in Europe but is not mentioned in the early Muslim period. This is the more surprising in that *pisos Mauriscos* were listed in about 800 by Charlemagne.

PLANE, **dulb**, although a famous sacred tree of the Middle East, did not appear in the West, whether Muslim or Christian, until the late twelfth century.

SHADDOCK (grapefruit), **bastanbūn, zanbūᶜ**, was like the lemon, one of the later citrus fruits to come into cultivation in the West.

SPINACH, **isfānaj**, was grown in Spain in the eleventh century and appears to have been known throughout southern Europe and the Mediterranean basin. In the north-west various greens were grown under the same name, but the true plant does not seem to have reached Britain, nor perhaps northern France, until the sixteenth century.[24]

Another source of information, slightly earlier than the work of Ibn Baṣṣāl, is the fragmentary translation of the lost *Compendium of Agriculture* by his predecessor Ibn Wāfid (1008–75). What survives mentions nearly 50 plants, of which 36 are included in our other sources and several cannot be identified. About eight species, however, are referred to that are not in the other lists, though they are not necessarily cultivated plants: caltrops, cyperus, Esparto grass, grass, juniper, maidenhair fern, rosemary, and terebinth.[25]

Although it emanates from eastern rather than western Islam, it seems relevant to quote also the *Treatise on Agriculture* (*Resālat al-filāḥa*), written in Persia or Central Asia

in the fifteenth century.[26] This constitutes the *Kitāb shajarat al-nihāl*, and is in much the same tradition as the Moorish sources of earlier centuries. This has sections upon shade trees, fruit trees, grapevines, ornamental plants, vegetables, salads, and herbs used as condiments. Some 40 species coincide with those in the western lists and only three are plants not named in the West: chicory (*Cichorium intybus* L.) whose flowers were recommended as a remedy for snakebite; watercress (*Rorippa nasturcium-aquaticum* (L.) Hayek) apparently substituted for garden cress; and mung bean (*Phaseolus* (*Vigna*) *aureus* Roxb. and *P.* (*Vigna*) *mungo* L.), rather than kidney bean, though mung bean does appear among peas in I.A. Thus we have, over a period of five centuries, a demonstration of the fundamental unity of Islamic gardening practice, from the tenth to the fifteenth centuries.

So far as these named crops from the Islamic world effectively reached northern Europe, it seems that they were transmitted through the Christian kingdoms of Spain, and perhaps especially by skilled gardeners working in Aragon, where relations between Muslim and Christian cultures were especially close. It is of particular note that the Spanish gardeners employed in England by Queen Eleanor of Castile shortly before 1290 were from Aragon and not from Castile.[27]

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6. See, notably, *The Oxford Companion to Gardens* (Oxford, 1986), e.g. articles on Islam, Middle East, Pleasance, Spain.

7. *Macri de Viribus Herbarum* (Naples, 1477, etc.); cf. G. Frisk (ed.), *A Middle English Translation of Macer Floridus* (Uppsala, 1949).

8. Charlemagne's 'Capitulare de Villis' is printed in *Monumenta Germaniae historica*, *Leges* II, vol. I (Hanover, 1883); see J. H. Harvey, *Mediaeval Gardens*, revised edition (1990), pp. 28–32.

9. Harvey, 'The Square Garden of Henry the Poet', *Garden History* XV. I (1987), pp. 1–11.

10. See note 3 above.
11. Harvey, *Mediaeval Gardens* (1990), pp. 118–19, 122, 159–62; 'Henry Daniel: a Scientific Gardener of the 14th Century', *Garden History*, XV. 2 (1987), pp. 81–93.
12. See the list of 258 plants in Harvey, *Mediaeval Gardens*, pp. 163–80.
13. Harvey, 'Garden Plants of around 1525: the Fromond List', *Garden History*, XVII. 2, (1989), pp. 122–34; the first references to jasmine and apricot as growing in England are in William Turner, *The Names of Herbes* (1548); neither is mentioned in his *Libellus de Re Herbaria* (1538) — see the facsimiles (London: The Ray Society, No. 145, 1965).
14. *Le Calendrier de Cordoue*, with French translation by Ch. Pellat (Leyden: E. J. Brill, 1961).
15. Bay, camomile, iris, jasmine, marigold, myrtle, narcissus, roses, stock and wallflower, violet.
16. Ibn Baṣṣāl, *Libro de Agricultura*, Arabic text with Spanish translation edited by J. M. Millás Vallicrosa and M. Aziman (Tetuan: Instituto Muley el-Hasan, 1955). The additional plants ascribed to Ibn Baṣṣāl by Ibn al-ʿAwwām (see note 4 above) are wild anise, cress, dragons, elecampane, endive, feverfew, iris, 'Macedonian bulb' (? *Iris variegata*), lavender, marum, 'Nofaj' melon, millet, mint, mustard, 'Nisrīn' (? *Narcissus elegans*), orach, origan, parsley, pea, savory, teasel, milk vetch, waterlily, woad. See also J. M. Millás Vallicrosa, 'La traducción castellana del "Tratado de Agricultura" de Ibn Baṣṣāl, *Al-Andalus* XIII (1948), pp. 347–430; and notes 1 and 4 above.
17. See note 4 above; R. T. Gunther (ed.), *The Greek Herbal of Dioscorides* (1934), IV.89, p. 485.
18. This identity was suggested by Richard Gorer.
19. The 'lily' of C.C. (**sūsan**, *lilia* in the Latin version) mentioned as flowering in March, can only be an iris, as pointed out to me by Richard Gorer. In Spain, however, the derived name *azucena* has always been applied to *Lilium candidum*.
20. This identification is very uncertain.
21. Although translated by Banqueri as 'Acacia', the description cannot be reconciled with any of the plants usually so named.
22. Richard Gorer tells me that some species of *Ruscus* are also eaten in Mediterranean Europe as 'Wild Asparagus', but these can be discounted here, since the Arabic names are completely distinct.
23. Confusion over the various large mallows is by no means confined to Arabic nomenclature: in English the name 'holihok' was used originally for the marshmallow (*Althaea officinalis* L.), and for the tree mallow (*Lavatera arborea* L.) The earliest description in English which can only mean *Alcea rosea* L. (our garden hollyhock) is that by Friar Henry Daniel (*c.* 1380), when he gives the names '*rosa hispanica*, rose of Spayne' and '*rosa hyemalys*, wynter rose, and *malua hyemalis*, winter malue' to a plant growing tall without branches, with large flowers red or white, borne until winter. In his time it grew in very few places in England, and only if planted or sown.
24. For a discussion of the sources on spinach, see J. H. Harvey, *Mediaeval Gardens* (1981; 1990), p. 166.
25. J. M. Millás Vallicrosa, 'La traducción castellana del "Tratado de Agricultura" de Ibn Wāfid', *Al-Andalus* VIII (1943), pp. 281–332.
26. British Library, Oriental MS 1771, fols 157–269 (see *Encyclopaedia of Islam*, new edition, II, p. 910). I am deeply obliged to Paul Loft, who generously gave his time to providing an extemporary translation and commentary from the medieval Persian text, in any case a remarkable feat.
27. See J. H. Harvey, 'Queen Eleanor of Castile as a Gardener', *The Garden History Society Newsletter* 5 (Summer 1982), pp. 3–4.

APPENDIX

THE PLANTS GROWN IN SOUTHERN SPAIN IN THE MIDDLE AGES

This list is in alphabetical order of English names, for ease of comparison with several lists of plants grown in the north of Europe, especially that in my *Mediaeval Gardens* (1990), pp. 163–80. The letters A — F are used to show occurrence in the following works:

A *Le Calendrier de Cordoue* (C.C.), *c.* A.D. 961–76
B Ibn Wāfid, *Compendium of Agriculture* (I.W.), *c.* 1060
C Ibn Baṣṣāl, *Book of Agriculture* (I.B.), *c.* 1080
D Ibn al-ᶜAwwām, *Book of Agriculture* (I.A.), *c.* 1180
E Ibn Luyūn, *Treatise of Agriculture* (I.L.), 1348
F *Treatise on Agriculture* (Persian), *c.* 1450

Wild plants for which there is no evidence of cultivation have not been included.

A B C D E F	ALMOND	*Prunus communis* (L.) Fritsch	**lauz**
A C D E	ANISE	*Pimpinella anisum* L.	**anīsūn**
C D	WILD ANISE	*Daucus gingidium* L.	**tamak**
A C D E F	APPLE	*Malus domestica* Borkh.	**tuffah**
A C D E	APRICOT	*Prunus armeniaca* L.	**barqūq, mishmish**
D E	ARTICHOKE	*Cynara scolymus* L.	**kharshaf**
C D	ASH	*Fraxinus excelsior* L.	**dardār**
A C D E	ASPARAGUS	*Asparagus officinalis* L.	**halyūn, āsfarāj**
A D E	AZAROLE	*Crataegus azarolus* L.	**zaᶜrūr al-ᶜanṣarī**
A C D E	BALM	*Melissa officinalis* L.	**turunjān**
A	BALSAM-TREE	*Commiphora opobalsamum* (Kunth) Engler	**balasān**
A D E	BANANA	*Musa paradisiaca* L.	**mūz**
A B D E	BARLEY	*Hordeum vulgare* L.	**shaᶜīr**
A B C D E	BASIL	*Ocimum basilicum* L.	**ḥabaq**
A C D E	BAY	*Laurus nobilis* L.	**ghār, rand**
C D	BEAD TREE	*Melia azedarach* L.	**āzādirakht**
A B C D E F	BROAD BEAN	*Vicia faba* L.	**fūl, bāqillā**
A C D E	KIDNEY BEAN	*Vigna cylindrica* (L.) Skeels (*unguiculata*)	**lūbiyā**
A B C D E F	SPINACH BEET	*Beta vulgaris* L.	**silq**
C	BINDWEED	*Calystegia sepium* (L.) R.Br.	**liblāb, nabkat**
C D		*Convolvulus scammonia* L.	
C		? *Cynanchum acutum* L.	
C D		*Ipomoea nil* (L.) Roth	
A C D E	BLITE	*Chenopodium capitatum* (L.) Aschers	**baqla al-yamānīya, yarbūz**
B D	BOXTHORN	*Lycium europaeum* L.	**ᶜausaj**
B D E	BRAMBLE	*Rubus fruticosus* L.	**ᶜullīq**
A B	BUGLOSS	? *Anchusa* sp.	**lisān al-thaur**
D	BUTCHER'S BROOM	*Ruscus aculeatus* L.	**khaizurān**
A B C D E	CAMOMILE	*Chamaemelum nobile* (L.) All. (*Anthemis nobilis* L.)	**bābūnaj**
C D E	CAPER	*Capparis spinosa* L.	**kabbar**

C D E	CARAWAY	*Carum carvi* L.	**karwiyā**
B D E	CAROB	*Ceratonia siliqua* L.	**kharrūb**
A C D E	CARROT	*Daucus carota* L.	**jazar**
A C D E	CAULIFLOWER	*Brassica oleracea* L. *cauliflora*	**qannabīṭ**
A C D E	CHERRY	*Prunus cerasus* L.	**ḥabb al-mulūk**
A C D E	CHESTNUT	*Castanea sativa* Miller	**shāh-ballūṭ**
C D E F	CHICKPEA	*Cicer arietinum* L.	**ḥummas**
B C D	CHUFA	*Cyperus esculentus* L.	**ḥabb al-zalem**
A C D E	CITRON	*Citrus medica* L.	**utrujj**
A	CLOVER	*Trifolium alexandrinum* L.	**qurṭ**
A B C D E F	COLEWORT (Cabbage)	*Brassica oleracea* L.	**kurunb**
C D E	COLOCASIA	*Colocasia antiquorum* Schott	**qulqās**
A C D	COLOCYNTH	*Citrullus colocynthis* (L.) Schrader	**ḥanẓal**
C D E	CORIANDER	*Coriandrum sativum* L.	**kuzbarah**
A D E	COTTON	*Gossypium herbaceum* L.	**quṭn**
A C D E	CRESS	*Lepidium sativum* L.	**ḥurf**
A B C D E	CUCUMBER	*Cucumis sativus* L.	**qithā**[c]
C D E	CUMIN	*Cuminum cyminum* L.	**kammūn**
A C D	BLACK CUMIN	*Nigella sativa* L.	**shunīz**
C D E F	CYPRESS	*Cupressus sempervirens* L.	**sarw**
A C D E F	DATE-PALM	*Phoenix dactylifera* L.	**nakhl**
A D	DILL	*Anethum graveolens* L.	**shabath**
A	DODDER	*Cuscuta epithymum* (L.) L.	**kushūthā**
C D	DRAGONS	*Dracunculus vulgaris* Schott	**lūf**
A C D E	EGG-PLANT	*Solanum melongena* L.	**bādinjān**
A C D E	ELECAMPANE	*Inula helenium* L.	**rāsin, janāḥ**
C D F	ENDIVE	*Cichorium endivia* L.	**sarīs, hindabā'**
A B D	FENNEL	*Foeniculum vulgare* Miller	**bisbās**
D E	FENUGREEK	*Trigonella foenum-graecum* L.	**ḥulba**
A C D	FEVERFEW	*Chrysanthemum parthenium* (L.) Bernh.	**uqḥuwān**
A B C D E F	FIG	*Ficus carica* L.	**tīn**
A	SYCOMORE FIG	*Ficus sycomorus* L.	**jummaīz**
C D E	FLAX	*Linum usitatissimum* L.	**kattān**
A	FLEA-SEED	*Plantago psyllium* L.	**qaṭūnā**
A D	FUMITORY	*Fumaria officinalis* L.	**shāhtiraj**
A B C D E F	GARLIC	*Allium sativum* L.	**thūm**
D E F	GHERKIN	*Cucumis sativus* L. var.	**khiyār**
A B C D E F	GOURD	*Lagenaria vulgaris* Ser.	**qar**[c]
A B C D E F	GRAPE-VINE	*Vitis vinifera* L.	**karum**
D	HAWTHORN	*Crataegus monogyna* Jacq.	**maḍagh**
A B C D E F	HAZELNUT	*Corylus avellana* L.	**jilauz, nārjīl, fauqal**
D E	HEMP	*Cannabis sativa* L.	**qinnab**
A C D	HENBANE	*Hyoscyamus niger* L.	**banj**

A C D E	HENNA	*Lawsonia inermis* L. (*alba*)	**ḥinnaᶜ**
D	HOLLYHOCK	*Althaea* (*Alcea*) *rosea* (L.) Cav.	**khaṭmī**
A	HOUSELEEK	*Aeonium arboreum* (L.) Webb & Berth.	**hayy al-ᶜālam**
A C D E	IRIS	*Iris* spp.	**īrīs, sūsan**
C D	('Macedonian bulb')	*I. variegata* L.	**baṣal al-maqdūnis**
D	IVY	*Hedera helix* L.	**yidhra, qissūs**
A B D E	JASMINE	*Jasminum officinale* L.	**yāsamīn**
D E	YELLOW JASMINE	*Jasminum fruticans* L.	**yāsamīn al-āṣfar**
D F	JUDAS TREE	*Cercis siliquastrum* L.	**dādhī**
A D E	JUJUBE	*Zizyphus jujuba* Miller	**ᶜanāb, nabaq, zifzif**
C D	LAVENDER	*Lavandula* spp.	**khuzāmā**
C	LEADWORT	*Plumbago europaea* L.	**shaṭrīa**
A B C D F	LEEK	*Allium porrum* L.	**kurrāth**
D E	LEMON	*Citrus limon* (L.) Burm. fil.	**līmūn**
C D E F	LENTIL	*Lens esculenta* Moench	**ᶜadas**
A B C D E F	LETTUCE	*Lactuca sativa* L.	**khassa**
B C D E F	LILY	*Lilium candidum* L.	**sūsan**
D E	LUCERNE	*Medicago sativa* L.	**fiṣfiṣah**
D E	LUPIN	*Lupinus albus* L.	**turmus**
A C D E	MADDER	*Rubia tinctorum* L.	**fuwwah**
D	SHRUB MALLOW	*Hibiscus syriacus* L.	**khaṭmī**
D E	GARDEN MALLOW	*Malva neglecta* Wallr.	**mulūḥīyā**
D	TREE MALLOW	*Lavatera arborea* L.	**khaṭmī**
C	MANDRAKE	*Mandragora officinarum* L.	**luffāh**
A	MARIGOLD	*Calendula officinalis* L.	**bahār**
A C D E	MARJORAM	*Origanum majorana* L.	**mardadūsh, marzanjūsh**
A C D E	MARSHMALLOW	*Althaea officinalis* L.	**khaṭmi**
C D E	MARUM	*Origanum maru* L.	**marw**
D E	MEDLAR	*Mespilus germanica* L.	**zuᶜrūr**
A C D E	MELILOT	*Melilotus officinalis* (L.) Pallas	**iklīl al-malik**
A C D E	MELON	*Cucumis melo* L.	**baṭṭīkh**
C D	MILK-VETCH	*Astragalus lusitanicus* Lam.	**baram**
A C D E F	MINT	*Mentha* spp.	**faudanaj, naᶜnaᶜ**
A C D E F	SILK MULBERRY	*Morus alba* L.	**firṣad**
A C D E F	BLACK MULBERRY	*Morus nigra* L.	**tūt**
D F	MUNG BEAN	*Phaseolus* (*Vigna*) *aureus* Roxb. / P. (*Vigna*) *mungo* L.	**māsh**
A	MUSHROOM OF MALTA	*Cynomorium coccineum* L.	**ṭarathith**
A C D E F	MUSTARD	*Sinapis alba* L.	**khardal**
A B D E	MYRTLE	*Myrtus communis* L.	**ās, rāiḥan**
A C D E	NARCISSUS	*Narcissus* spp.	**narjis**
C D	AUTUMN NARCISSUS	*Narcissus elegans* Spach	**nisrīn**
A D E	WHITE NARCISSUS	*Narcissus papyraceus* Ker-Gawler	**bahār ābyad**

A C D E	YELLOW NARCISSUS	*Narcissus* spp.	**narjis āṣfar**
D E	NETTLE TREE	*Celtis australis* L.	**almīs**
A C D E F	HOLM OAK	*Quercus ilex* L. (etc.)	**ballūṭ**
D E	OLEANDER	*Nerium oleander* L.	**diflā**
A B C D E F	OLIVE	*Olea europaea* L.	**zaitūn**
A B C D E F	ONION	*Allium cepa* L.	**baṣal**
C D E	ORACH	*Atriplex hortensis* L.	**qaṭaf**
C D E F	SEVILLE ORANGE	*Citrus aurantium* L.	**nāranj**
A C D E	ORIGAN	*Origanum vulgare* L.	**ṣaᶜtr**
C D E	PARSLEY	*Petroselinum crispum* (Miller) A. W. Hill	**karafs**
D	'PARSNIP'	*Pastinaca schekakul* Russ.	**shaqāqul**
C D E	PEA	*Pisum sativum* L.	**julbān**
A B C D E F	PEACH	*Prunus persica* (L.) Batsch	**khūkh**
A C D E F	PEAR	*Pyrus communis* L.	**kummathrā, ijjāṣ**
A C D E	PINE	*Pinus pinea* L.	**sanaubar**
A C D E	PISTACHIO	*Pistacia vera* L.	**fistiq**
D	PLANE	*Platanus orientalis* L.	**dulb**
D E	PLANTAIN	*Plantago* spp.	**lisān al-ḥamal**
A C D E F	PLUM	*Prunus domestica* L. / *P. cerasifera* Ehrh.	**ᶜuyūn al-baqar**
A B C D E F	POMEGRANATE	*Punica granatum* L.	**rummān**
C E	BLACK POPLAR	*Populus nigra* L.	**nashm āswad**
C E	WHITE POPLAR	*Populus alba* L.	**nashm ābyaḍ**
C D	HORNED POPPY	*Glaucium flavum* Crantz	**māmīthā**
A C D E	OPIUM POPPY	*Papaver somniferum* L.	**khashkhāsh**
A C D	PURSLANE	*Portulaca oleracea* L.	**rijla**
A C D E F	QUINCE	*Cydonia oblonga* Miller	**safarjal**
A B C D E F	RADISH	*Raphanus sativus* L.	**fujl**
B D E F	REED	*Arundo donax* L.	**qaṣab al-qaṣṣābīn**
A C D E	RICE	*Oryza sativa* L.	**aruzz**
D	ROCKET	*Eruca sativa* Miller	**jirjīr**
A B C D E F	ROSE	*Rosa* spp.	**ward**
A B C D E F	RUE	*Ruta graveolens* L.	**sadhāb**
A C D E	SAFFLOWER	*Carthamus tinctorius* L.	**ᶜaṣfar**
A C D E	SAFFRON	*Crocus sativus* L.	**zaᶜfarān**
C D E F	SAVORY	*Satureia* spp.	**shaṭrīya, ṣaᶜtar**
D	SCREW-PINE	*Pandanus tectorius* Solander	**kādī**
A C D E	SEBESTEN	*Cordia myxa* L.	**sabastān**
A C D E F	SERVICE	*Sorbus domestica* L.	**mushtahī, ghubairā**
C D E	SESAME	*Sesamum indicum* L.	**simsim**
A	SESELI	*Ferula* spp.	**sisiliūs**
D	SHADDOCK (Grapefruit)	*Citrus maxima* (Burm.) Merr.	**bastanbūn, zanbūᶜ**
D	SILK-VINE	? *Periploca graeca* L.	**yāsamīn urkhuwānī**
A B D E	SMALLAGE	*Apium graveolens* L.	**karafs**

D	SORREL	*Rumex acetosa* L.	**hummāḍ**
C D E	SPINACH	*Spinacia oleracea* L.	**isfānaj**
A	STAVESACRE	*Delphinium staphisagria* L.	**habb al-rās**
A C D E	STOCK	*Matthiola incana* (L.) R.Br.	**khairī**
C D	STRAWBERRY TREE	*Arbutus unedo* L.	**ᶜaṭlab**
A D E	SUGAR-CANE	*Saccharum officinarum* L.	**qaṣab al-sukkar**
A D	SUMACH	*Rhus coriaria* L.	**summāq**
D E	TARES	*Vicia* spp.	**kasnā, karsanah**
C D	TEASEL	*Dipsacus fullonum* L.	**shūk al-darākhīn**
A E	THYME	*Thymus* spp.	**ṣaᶜtar, sharrīn**
A B C D E	TURNIP	*Brassica rapa* L.	**lift, siljam**
A C D E	VIOLET	*Viola odorata* L.	**banafsaj**
C D E	WALLFLOWER	*Cheiranthus cheiri* L.	**khairī**
A C D E F	WALNUT	*Juglans regia* L.	**jauz**
F	WATERCRESS	*Rorippa nasturcium-aquaticum* (L.) Hayek	**jarjīr**
C D	WATERLILY	*Nymphaea alba* L.	**nīlūfar**
A B C D	WATERMELON	*Citrullus vulgaris* Schrader	**dalāᶜ al-hindī, baṭṭīkh al-sandī**
A B D E F	WHEAT	*Triticum aestivum* L.	**qamḥ**
D E	WILLOW	*Salix* spp.	**ṣafṣāf**
C D	WOAD	*Isatis tinctoria* L.	**ʔ ḥabaq al-ᶜajab**
A C D E	WORMWOOD	*Artemisia absinthium* L.	**ifsintīn**